



For Supervisor's use only

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90147



NEW ZEALAND QUALIFICATIONS AUTHORITY  
MANA TOHU MĀTAURANGA O AOTEAROA



National Certificate of Educational Achievement  
TAUMATA MĀTAURANGA Ā-MOTU KUA TAEA

## Level 1 Mathematics, 2004

### 90147 Use straightforward algebraic methods and solve equations

Credits: Four

9.30 am Thursday 11 November 2004

Check that the National Student Number (NSN) on your admission slip is the same as the number at the top of this page.

You should answer ALL the questions in this booklet.

You should show ALL working.

If you need more space for any answer, use the page provided at the back of this booklet and clearly number the question.

Check that this booklet has pages 2–7 in the correct order and that none of these pages is blank.

**YOU MUST HAND THIS BOOKLET TO THE SUPERVISOR AT THE END OF THE EXAMINATION.**

Achievement Criteria			For Assessor's use only
Achievement	Achievement with Merit	Achievement with Excellence	
Use straightforward algebraic methods. <input type="checkbox"/>	Use algebraic methods and solve equations in context. <input type="checkbox"/>	Use algebraic strategies to investigate and solve problems. <input type="checkbox"/>	
Solve equations. <input type="checkbox"/>			
Overall Level of Performance (all criteria within a column are met)			<input type="checkbox"/>

You are advised to spend 25 minutes answering the questions in this booklet.

## At the Pool

You should show **ALL** working.

### QUESTION ONE

Solve these equations:

(a)  $(3x - 1)(x + 2) = 0$

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(b)  $6x - 2 = 2x + 9$

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(c)  $\frac{5x}{2} - 1 = 3$

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### QUESTION TWO

Expand and simplify:

$(3x - 1)(2x + 5)$

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**QUESTION THREE**

Factorise completely:

$$x^2 - 7x + 6$$

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**QUESTION FOUR**

Simplify:

$$\frac{12x^6}{4x^2}$$

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**QUESTION FIVE**

In a diving competition, the score ( $R$ ) for a dive is calculated using the formula

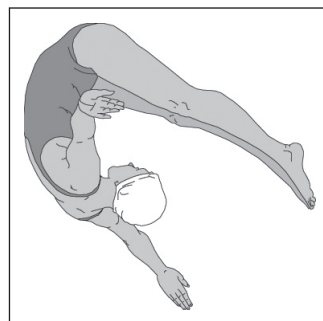
$$R = 0.6 DT$$

where  $D$  is the degree of difficulty for the dive  
and  $T$  is the total of the judges' marks.

Jill does a dive with degree of difficulty  $D = 2.5$ .

The judges' marks had a total  $T = 34.5$ .

Calculate the score,  $R$ , for Jill's dive.




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$R =$  \_\_\_\_\_

**QUESTION SIX**

Simplify:

$$\frac{3a^2 - 15ab}{6a^2}$$

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**QUESTION SEVEN**

John saved \$4000 for a trip to the Olympic Games.  
 He wanted to buy as many tickets to the swimming as possible.  
 Each ticket to the swimming costs \$85.  
 Travel, food and accommodation cost \$3100.

Use this information to write an equation **or** inequation.

Solve your equation or inequation.

What is the greatest number of tickets to the swimming that John could buy?

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**QUESTION EIGHT**Assessor's  
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Janet bought tickets to the diving and the swimming at the Olympic Games.

She paid \$1095 for 15 tickets.

The tickets for the diving cost \$65 and the tickets for the swimming cost \$85.

Solve the pair of simultaneous equations to find the number of tickets Janet bought for the swimming.

$$65d + 85w = 1095$$

$$d + w = 15$$

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At the Olympic Games 40 years ago, the **average number of competitors per sport** was 5 times the number of sports played.

In 2004 the average number of competitors per sport was 3.5 times greater than 40 years ago.

Write **at least** ONE equation to model this situation.

**Show all your working.**

[illegible]

**Extra paper for continuation of answers if required.  
Clearly number the question.**

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Question Number	Answer
1	1. The first step in the process of creating a business plan is to conduct a market research. This involves gathering information about the market, the industry, and the competition. This information is then used to develop a business plan that outlines the company's goals, strategies, and financial projections.
2	2. The second step in the process of creating a business plan is to develop a marketing strategy. This involves identifying the target market, developing a marketing mix, and creating a marketing budget. The marketing strategy is then used to develop a business plan that outlines the company's goals, strategies, and financial projections.
3	3. The third step in the process of creating a business plan is to develop a financial plan. This involves estimating the company's costs, revenues, and profits. The financial plan is then used to develop a business plan that outlines the company's goals, strategies, and financial projections.
4	4. The fourth step in the process of creating a business plan is to develop a management plan. This involves identifying the key personnel, their roles, and their responsibilities. The management plan is then used to develop a business plan that outlines the company's goals, strategies, and financial projections.
5	5. The fifth step in the process of creating a business plan is to develop a risk management plan. This involves identifying the potential risks to the company and developing strategies to mitigate them. The risk management plan is then used to develop a business plan that outlines the company's goals, strategies, and financial projections.